SCIENCE

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SCIENCE IN AMERICA.

THE annual meeting of the American Association for the Advancement of Science should be made the great scientific event of each year. We need special societies where students from the different centers of research may present and discuss the advances of a single science, and we need local academies where men of science working in different directions may meet on common ground. But more important than these is a meeting where all localities and all sciences are represented—a clearing house for the work of the year, where accumulations may be reported and balances adjusted. The conditions of science in America make such a meeting difficult but at the same time peculiarly desirable.

There is, indeed, no such thing as American science. We may regret that we have no school of American literature or of American art, but science is universal. It is not limited by language, nor by political and social institutions. We build us a city and a tower whose top may reach unto heaven, and our work is not stayed, though we have many languages and be scattered abroad on the face of the whole earth. But there is such a thing as science in America. We build us one city, but the stone and mortar must be taken from the ground on which we stand. We, who live and work in America, have certain advantages and certain obstacles, as compared with the great nations of Europe, with

which we should seek to advance on terms of equal service.

Atmospheric conditions have led to success in astronomical observations and photography. The great extent and diversified surface of the land have offered unusual opportunities for geological research and have preserved rich paleontological remains. The surviving tribes of savages and the unobliterated relics of extinct races have given the anthropologist a favorable field. In astronomy, in geology, in paleontology and in anthropology we have not failed to take advantage of our position and stand equal at least with other nations. But the extent and newness of our *habitat* bring with them certain corresponding disadvantages. We have no one center, such as London, Paris and Berlin, where men of science may meet and be stimulated by personal contact. We must travel great distances, and at a time of year when traveling is most difficult, in order to attend the annual meetings of our Association.

Our unexplored resources have made desirable, and our more flexible institutions have made possible, the establishment of scientific departments under the government. The Geological Survey, the Coast and Geodetic Survey, the Weather Bureau, the Department of Agriculture and other institutions, have been supported by liberal subsidies and have contributed greatly to the advancement of science. On the other hand, the connection of science with politics is fraught with many dangers, and the alliance requires continual vigilance in order that the liberty of science may be maintained.

The rapid development of our material institutions has stimulated invention and the applications of science. But it is probable that in some cases the energy directed to applied science has been diverted from the advancement of pure science. The acquirement of large fortunes and an aristocracy of wealth have lead to the rich endowment of educational and scientific institutions. On the other hand, the attractions of commercial success have drawn too much of the best ability of the country, and we lack a leisure class contributing to, and taking an intelligent interest in, the progress of science.

Our advantages we have and need not lose. The drawbacks are such as can be obviated or mitigated by proper appreciation and generous effort. Men of science should unite and stand together, even though on occasion it may require self-sacrifice on the part of the individual. In every community, whether of men or of the lower animals, each member must be prepared to sacrifice something, and it may be everything to the general welfare. A community whose members are not ready to give and to take cannot survive.

No one can consider what a difference it would make to the world at the present day if the men of science of this century had not been faithful to their work, without realizing the responsibility of those of us who are now engaged in the advancement of science. Not only our material surroundings, but also our social institutions and ethical ideas, are dependent on the progress of science. Those who appreciate the extent to which this is the case will not willingly leave scientific work for the counting room or patent office; they will not

only themselves do the best work in their power, but they will help others and will seek to make straight the way along which science must advance.

Our various scientific institutions should have the sincere support of all men of science. If our scientific journals seem less strong than those of Europe, this is not a reason for neglecting them, but rather for doing our utmost in their support. If our universities accomplish less original research than those of Germany, this should lead each to devote his best energy to research, not forgetting to advocate in season and out of season the truth that research is the essence of the university. If our National Academy of Sciences seems less active and influential than the Paris Academy, this is a reason for taking greater interest in its proceedings. If the American Association for the Advancement of Science does not accomplish as important work as the British Association, this is a reason for attending the present meeting.

Such institutions are essential for science, and those who do not aid in their support are parasites in the body politic. They are essential in part as connecting links between the man of science in his workshop and the intelligent public outside. Investigations require money; this will be forthcoming from the Nation, from the State and from the man of wealth if the needs and importance of science be brought into notice, but not otherwise. More than money, science requires recruits. The best ability of the younger men is needed and should be obtained. We must not depend on in-breeding, but should draw from the widest field.

Our scientific institutions are not only essential in order to keep science in connection with the outside world, but also to hold men of science in touch with each other. Specialization must not be carried so far that the final unity of science is forgotten, and men of science must not lose the stimulus of communication and personal contact. For, as Professor Newcomb wrote in his introduction to the new series of this JOURNAL, "The experience of centuries shows that great successes in advancing scientific knowledge cannot be expected even from the most gifted men so long as they remain isolated."

In order to do the best we can for science in America our duties are many and are often difficult and conflicting. But at the present moment the next step should be in the direction of Buffalo. The decennial meetings in that city have hitherto been successful, both from a scientific and from a social point of view. If all those will attend next week who have at some time proposed to do so, or who would if it were not for relatively slight obstacles, the meeting can be made the most important in the history of the Association.

*ZOOLOGY AS A FACTOR IN MENTAL CULTURE.**

IT is not my purpose at the beginning of this address to weary you with apologies. I

*An address delivered before the department of Natural Science Instruction of the National Educational Association, July 10, 1896.

President David Starr Jordan, of Stanford University, expected to discuss the subject of this paper before the Association, but his absence on the commission to investigate the seals in the Alaskan waters prevented him from preparing the paper and from being present at the meeting. The writer was solicited to fill the gap a few days before the meeting.